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Electrolysis for Power to Fuel

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Synthetic fuels (synfuels) in the form CO_2 neutral "green" hydrocarbon fuels seem particularly benign to replace the fossil fuels, and electrolysis seems to be a feasible step in production of green fuels. In particular, synthetic hydrocarbon based fuel will be necessary for the heavy transportation vehicles such as airplanes, ships, and trucks.
In order to produce green fuel it is necessary to use green (sustainably produced) energy, e.g. wind solar or hydropower, which we may get in the form of electricity. If the electricity is used to produce H_2 and/or CO from H_2O and CO_2 by electrolysis then the synthesis gas (or syngas, H_2 + CO) can easily be converted into CO_2 neutral hydrocarbon fuel. This kind process is called "power to fuel" (P2F). The salient process in this technology is electrolysis.
The presentation will briefly summarize the status and perspectives of electrolytic production of H_2 and CO and the further possibilities for production of synfuels on basis of these two gases.